

# The COVID-19 Pandemic and Agroecosystems Resilience: Insights based on a review

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# COVID-19 Pandemic and Agroecosystem Resilience: Early Insights for Building Better Futures

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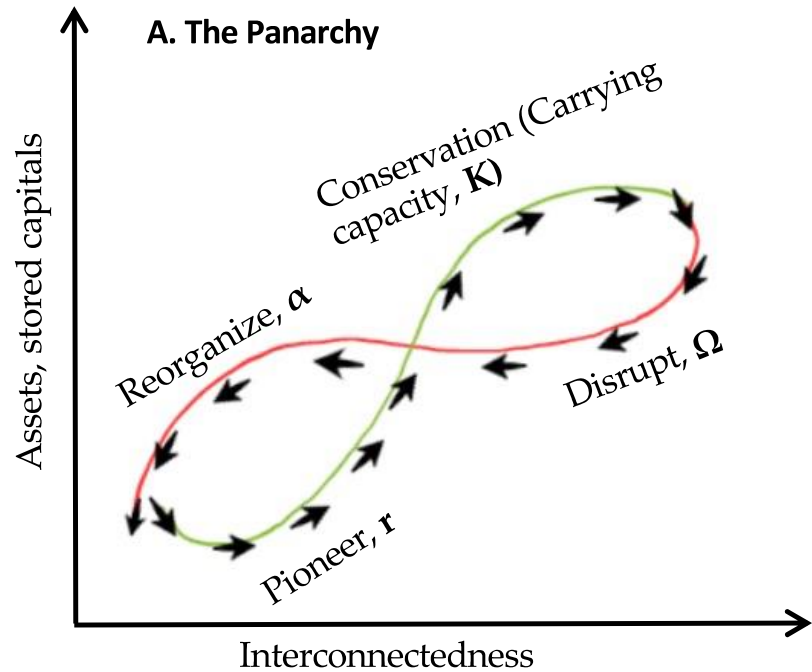
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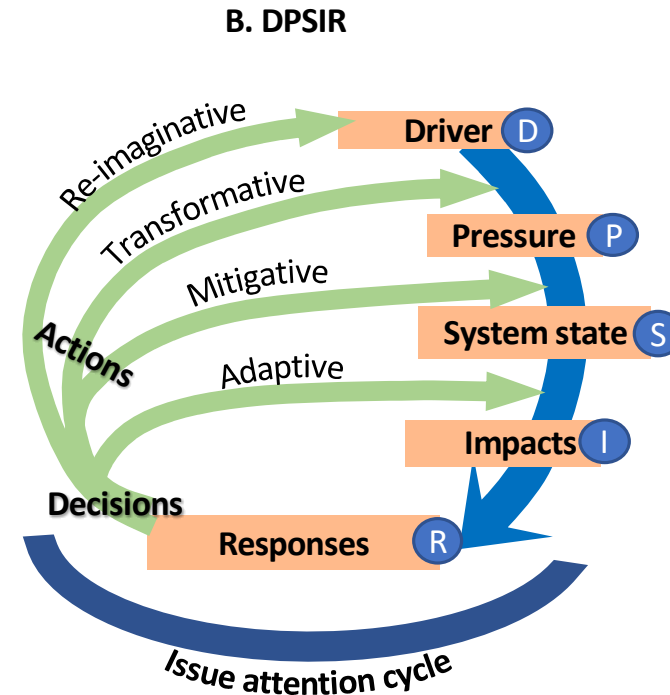
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# Relevant theoretical frameworks used



Holling, C.S.; Gunderson, L.H. *Panarchy: Understanding Transformations in Human and Natural Systems*; Island Press: Washington, DC, USA, 2002.



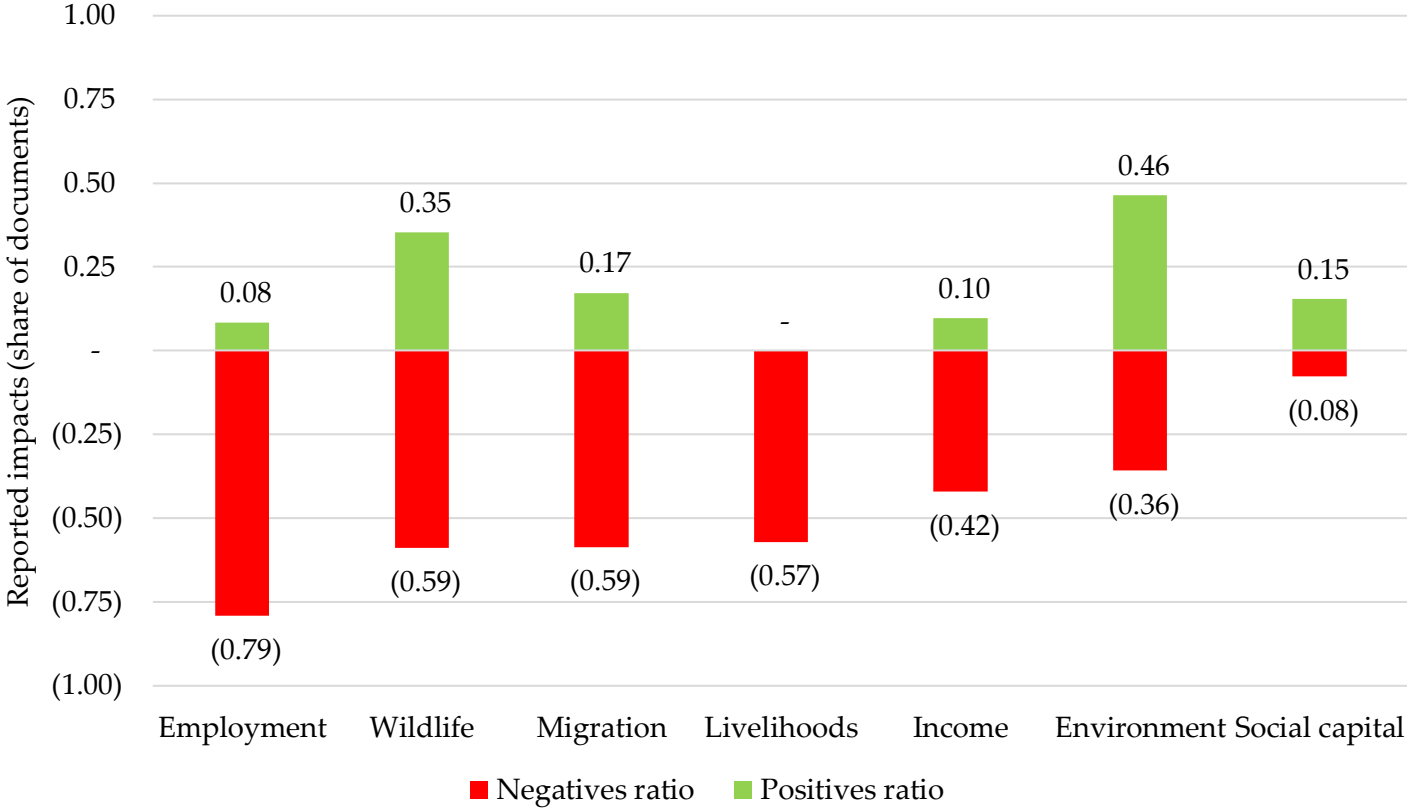
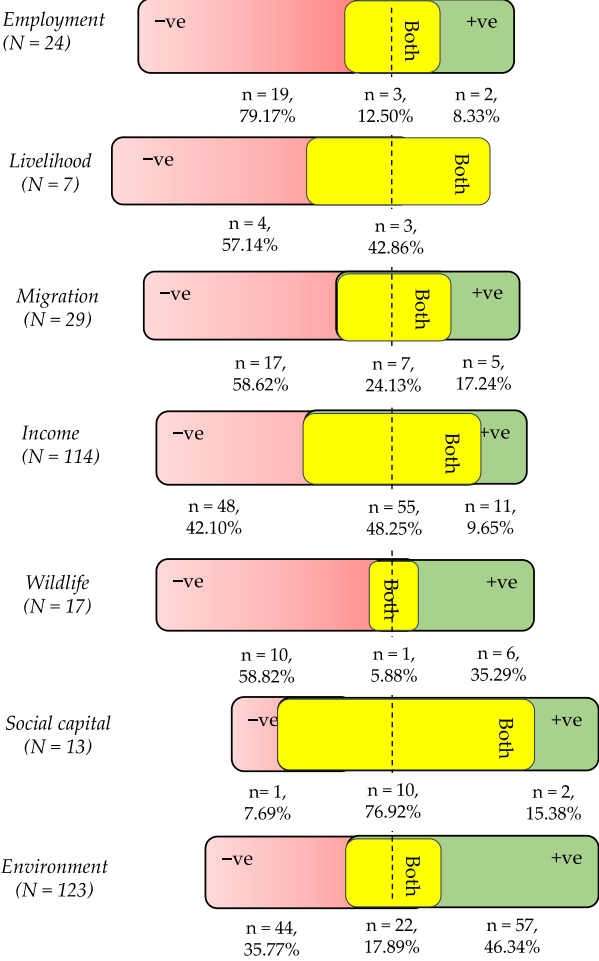
Van Noordwijk, M.; Speelman, E.; Hofstede, G.J.; Farida, A.; Abdurrahim, A.Y.; Miccolis, A.; Hakim, A.L.; Wamucii, C.N.; Lagneaux, E.; Andreotti, F.; et al. Sustainable Agroforestry Landscape Management: Changing the Game. *Land* 2020, 9, 243.

# The review process

| Search Description                           | Search Term Combinations (Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.) for All Years | Retrieved Documents as of 6 December 2020 | Documents Screened for Analysis after Qualifying the Retention Criteria |
|--|--|---|---|
| COVID-19 and its relations to environment    | title: (COVID *) AND<br>title: (environment *)                                     | 279                                       | 123   |
| COVID-19 and its relations to wildlife       | title: (COVID *) AND<br>title: (wildlife *)  | 18  | 17  |
| COVID-19 and its relations to income         | title: (COVID *) AND<br>title: (income *)  | 118                                       | 114   |
| COVID-19 and its relations to migration      | title: (COVID *) AND<br>title: ('migration')                                       | 36  | 29  |
| COVID-19 and its relations to livelihood     | title: (COVID *) AND<br>title: (livelihood *)                                      | 9   | 7   |
| COVID-19 and its relations to employment     | title: (COVID *) AND<br>title: (employment *)                                      | 29  | 24  |
| COVID-19 and its relations to social capital | title: (COVID *) AND<br>title: (social capital *)                                  | 13  | 13  |
|  | Total  | 502                                       | 327   |



# What researches are showing about the impacts/ consequences



# Impact - Agriculture



| Immediate Issues/Impacts                             | Likely Consequences  |
|--|--|
| Decreased labor supply (even if it may be temporary) | Poor agricultural productivity   |
| Limits farming input supplies                        | Total production loss or low agricultural production and hence poverty |
| Increased costs of agricultural inputs               | Declining benefits to farming communities                              |
| Less adaptative crop varieties are used for farming  | No or very low productivity with likely effect of food insecurity      |
| Weakens innovation through research for development  | Future of agriculture is uncertain unless innovation picks up          |
| Less disease and pest resistant crops varieties used | Poor agricultural productivity and likely food insecurity              |
| Poor soil management                                 | Degradation of agricultural lands and hence low productivity           |

# Impact - Forestry

<https://www.nature.com/news>

## Why deforestation and extinctions make pandemics more likely

As humans diminish biodiversity by cutting down forests and building more infrastructure, they're increasing the risk of disease pandemics such as **COVID-19**.

<https://www.cirad.fr/press-area/press-releases/zoon...>

## Zoonotic disease emergence and deforestation: a vicious circle

5 Jan 2021 — Zoonotic disease emergence and **deforestation**: a vicious circle exacerbated by the **effects of Covid-19** ... The current pandemic and its economic ...

<https://www.conservation.org/stories/impact-of-covi...>

## Impact of COVID-19 on Nature - Conservation International

People who have lost their employment in cities are returning to their rural homes, further increasing the pressure on natural resources while also increasing ...

<http://www.fao.org/2019-ncov/q-and-a/impacts-o...>

## Q&A: The impacts of COVID-19 on the forest sector - Food and ...

Q1: How is **COVID-19** affecting forests and their biodiversity? It is possible that the **COVID-19** pandemic may lead to an increase in **deforestation** and associated ...

<https://www.ncbi.nlm.nih.gov/articles/PMC7526655>

## Emerging threats linking tropical deforestation and the COVID ...

by PHS Brancalion · 2020 · Cited by 22 — Evidence suggests that the **COVID-19** pandemic has spurred illegal, opportunistic forest clearing in tropical countries, threatening forest ...

<https://news.mongabay.com/2020/12/how-the-pand...>

## How the pandemic impacted rainforests in 2020: a year in ...

28 Dec 2020 — Another **impact of COVID-19** has been to reverse the long-term rural-to-urban migration. This trend, which may not be sustained long after the ...

| Immediate Issues/Impacts                  | Likely Consequences  |
|---|--|
| Illegal forestland encroachment expansion | Degraded forests and hence low ecosystem services generation e.g., hydrological and habitat values |
| Any forest inventories may not happen     | Except delays in forest data though not an immediate worry   |



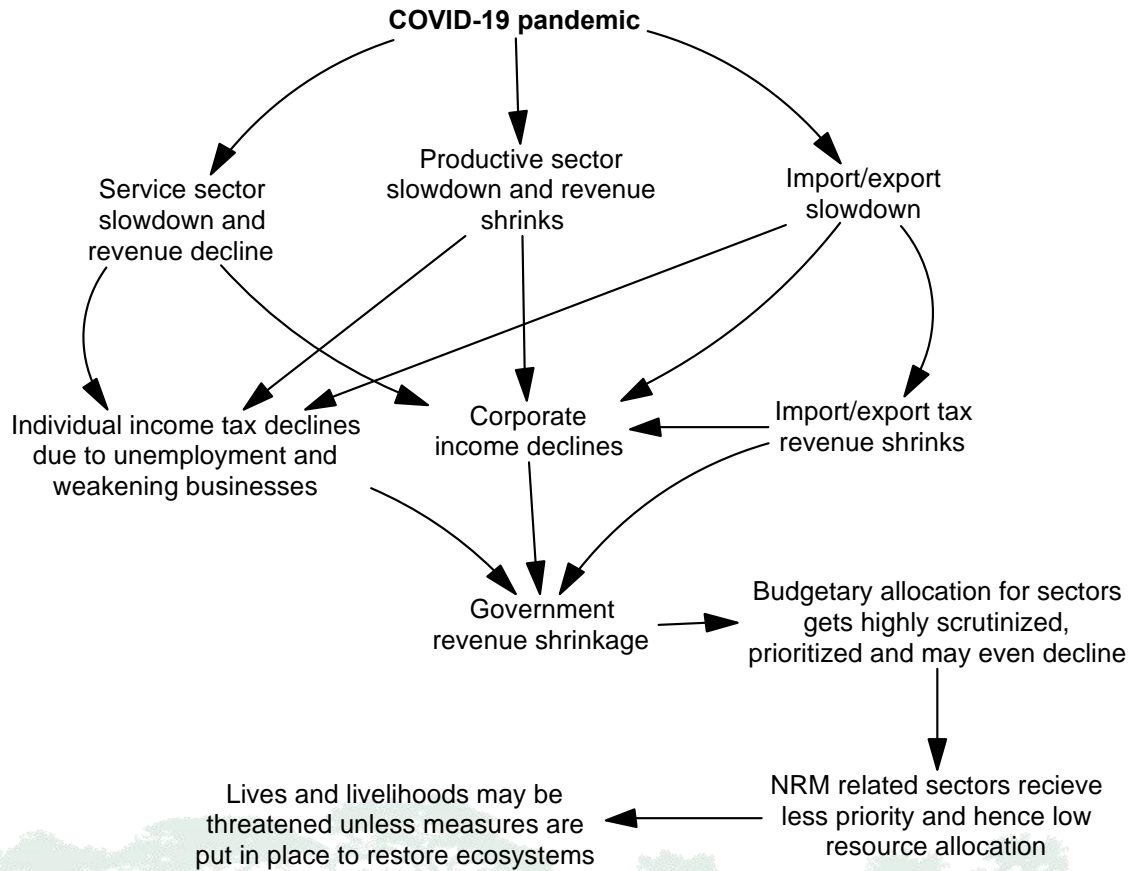
# Impacts – Wildlife, Fishery, Water resources



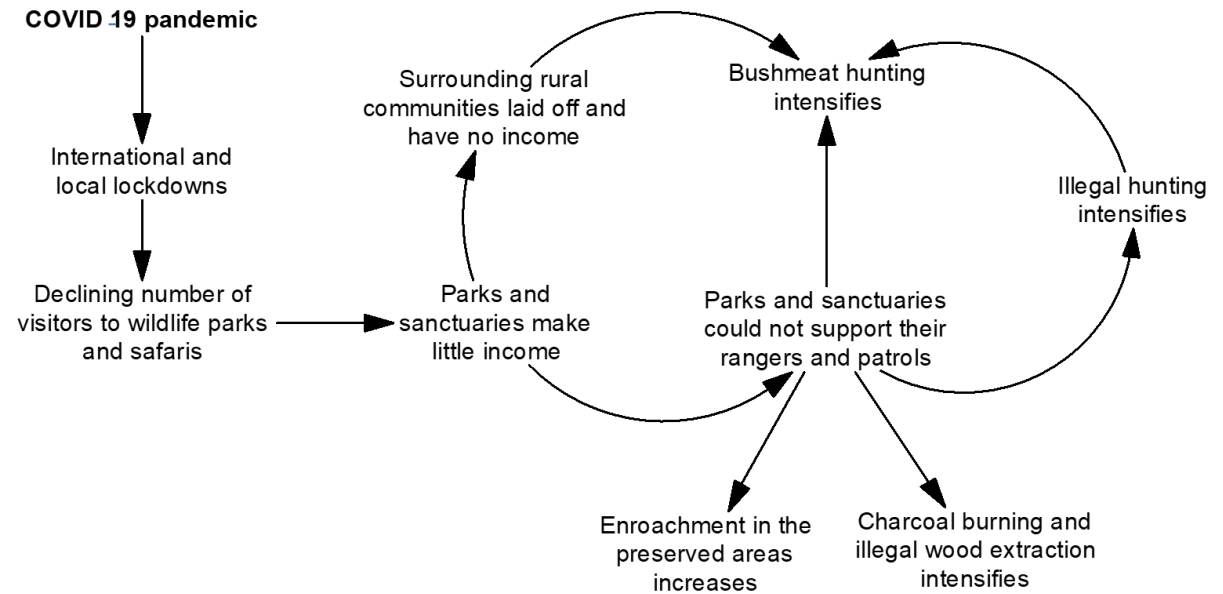
| Sector                 | Immediate Issues/Impacts  | Likely Consequences   |
|------------------------|---|---|
| <b>Fishery</b>         | Unpredictable fishing livelihoods                               | Future fishing dependent livelihoods may be threatened                                |
| <b>Wildlife</b>        | Poaching and bushmeat hunting expansion                         | Wildlife resources may decline  |
|                        | Exposure of protected areas and conservation areas to intruders | Conservation areas could be exposed to land grabbing and wildlife could be endangered |
| <b>Water resources</b> | Pollution of water resources may be a challenge                 | Community health impact may become a significant concern                              |



# Government revenue & NRM



# Parks and wildlife sanctuary management



# Impact – on Ecosystem services from agroecosystems

|        | Sources from Agroecosystems/ Socioecological Systems | How COVID-19 Pandemic May Affect the Supply Sources   |
|--------|--|---|
| Food   | Crops  | Disruptions in inputs supply and crop calendar - crop production is likely to be affected.  |
|        | Livestock  | Due to disruptions in livestock market, animal medication particularly vaccinations – affecting productivity and herd sizes                                     |
| Energy | Wild foods (fish, bushmeat, honey, tree foods)       | Increased extraction for wild foods, hunting and wild food collection   |
|        | Electricity  | Less income for households means declining affordability of electricity.  |
|        | Forest wood  | Extraction of wood energy from forests may increase due to the low affordability of electricity.  |
|        | On-farm trees  | Use of on-farm trees for cooking and heating increases. Farmers may even sell wood for energy to earn income.   |
|        | Solar power  | Access to solar panels and other accessories declines due to international trade disruptions  |
| Water  | Freshwaters (stream sand rivers)                     | Rising waste management problem (e.g. face masks and gloves produced, used and disposed ending up in streams and rivers)  |
| Health | Local health facilities                              | Access to local health services declines; due to shrinking income people revert to traditional and herbal medicines mostly originating from the agroecosystems. |
|        | Herbal/traditional medicines                         | Exploitation of plant-based traditional medicines increases as affordability of health facilities declines.   |
| Income | Annual crops   | Sales of crop harvests disrupted and those producing fragile crops lose significantly; Input supply disruptions   |
|        | Tree commodities (coffee, coconut, oil palm, etc.)   | Tree products marketing reduced due to export disruptions and market slowdown [38]; input supplies; labor shortage  |
|        | Shrinking employment opportunities                   | Activity slowdowns or closures led to job losses by those working as casuals and in the service sector workers in urban and rural areas                         |



# Thank you

[cifor.org](http://cifor.org) | [worldagroforestry.org](http://worldagroforestry.org)

[foreststreesagroforestry.org](http://foreststreesagroforestry.org) | [globallandscapesforum.org](http://globallandscapesforum.org) | [resilientlandscapes.org](http://resilientlandscapes.org)

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